

RESPONSE TO REVIEWERS

We would like to thank Dr. Langmann for her comments.

Note: All reviewer comments in *italics*; all responses by the authors in normal font.

B. Langmann

I am delighted to see this ACPD paper appearing again, after the first version of Gantt and Meskhidze with the same title (ACPD 11, 425-452, 2011) was withdrawn from review. The main and obvious difference between both ACPD papers is the list of coauthors. In addition, some more references are given and small parts of the text and some figures are updates. Both ACPD manuscripts represent a major step forward in our understanding of the contribution of organic carbon to sea-spray aerosols. Since the publication of O'Dowd et al. (2008) the proposed organic-inorganic sub-micron sea-spray source function has been revised multiple times (e.g. Vignati et al., 2010; Langmann et al., 2008), focussing however on minor modifications of the fitting parameters without re-thinking about the physics of the processes involved in the ocean-atmosphere exchange processes of organic carbon aerosols. Here a process so far overlooked is taken into account: the wind-speed dependency, thus filling the empirical organic-inorganic sub-micron sea-spray source function of O'Dowd et al. (2008) and successors with some process understanding and background. As worldwide measurements of the fraction of organic carbon in sea-spray are limited, in particular in the tropics, physically based parameterisations of the contribution of sub-micron organic carbon in sea-spray as the one presented in the current paper, may also increase our confidence in such regions.

We appreciate your comment and acknowledge that much of your earlier work (Langmann et al., 2008; O'Dowd et al., 2008; etc) was influential in this study. We are hopeful that our process-based approach will not only be an important contribution to the set of marine primary organic aerosol emission parameterizations but will also be helpful in directing future experimentation and modeling efforts that will improve our understanding of this aerosol source.